second fulfillment server 16 can be designed to communicate to its LFMs 22 and/or ATP servers 14 so as to minimize and balance the processing load placed upon each of those LFMs 22 and/or ATP servers 14. Alternatively, the various LFMs 22 and/or ATP servers 14 may be given different time slices of the horizon to handle, and component quotations 34 may be broken down and staged accordingly. This may increase latency to optimize scalability with respect to size and throughput.

In one embodiment, the components of system 10 use a protocol referred to as "Request-Promise-Accept" (RPA) in creating, managing, and fulfilling ATP requests relating to products. In general, according to the RPA protocol, a customer requests one or more products and a supplier offers a promise that meets the requirements of the customer request as closely as possible. Upon reviewing the offered commitment from the supplier, the customer either accepts or rejects the promise. If the customer accepts the promise, both customer and supplier generally consider this acceptance to form a binding agreement. In certain situations, a customer cannot freely cancel an acceptance within a specified time interval because of this commitment. The RPA protocol was developed as the basis for managing supply and demand requests between autonomous planning domains of a distributed supply chain as part of the RHYTHM supply chain planner (SCP) engine from i2 TECHNOLOGIES, INC. In another embodiment, fulfillment server 16 may use business rules to examine a supplier quotation or promise and determine if it meets the requirements of the customer. Based on that determination, fulfillment server 16 may either accept or reject the quotation or promise. In addition, fulfillment server 16 may allow a LFM 22, ATP server 14, or other supplier system to withdraw a component quotation. For example, a supplier may lose a source of raw materials for one of its products, and the supplier may take steps to withdraw any quotations involving that product. The ability to withdraw a quotation may depend on the status of the quotation. For example, a supplier may be unable to withdraw a quotation that has been accepted by a client 12.

Although FIGURE 1 illustrates one example embodiment of system 10, various changes may be made to system 10 without departing from the scope of the present invention. For example, FIGURE 1 illustrates fulfillment server 16 as being separate from clients 12, ATP servers 14, and LFMs 22. In another embodiment,

fulfillment server 16 may be combined with a client 12, an ATP server 14, and/or a LFM 22. Also, the logic used by LFM 22 to perform its described operations may be performed by a client 12, ATP server 14, or fulfillment server 16. As particular examples, the logic of LFM 22 could be executed by a procurement management system of a client 12 or an order entry system of a supplier. Further, system 10 could be given only limited access to the availability information of a supplier. For example, a supplier may only store a portion of its availability information in ATP server 14, and/or LFM 22 could be given only limited access privileges to the information in ATP server 14. This would allow, for example, a supplier to sell a portion of its products using system 10 and sell the remaining portion of its products through other sales mechanisms.

FIGURES 2 through 5 illustrate the operation of system 10 through a series of workflows. These and other described workflows involve an interactive scenario with full use of the extended RPA protocol according to the present invention. However, not all workflows need to be interactive and not all result in full use of the extended RPA protocol. For example only and not by way of limitation, large companies may often process the bulk of their customer orders using EDI based techniques, in which an ATP request results in an ATP-consuming promise without further customer interaction. Those skilled in the art will appreciate that system 10 accommodates EDI-based and other suitable workflows, and that the present invention is intended to encompass all such workflows and associated operations. Also, the following descriptions describe fulfillment server 16 communicating with an ATP server 14 through a LFM 22. As described above, LFM 22 could maintain a local or other database and is not required to use an associated ATP server 14. In this embodiment, the functions described below as being performed by ATP server 14 may be performed by LFM 22, and the functions described below as being performed by LFM 22 to facilitate communication with ATP server 14 may or may not be needed.

ATP Request Workflow

FIGURE 2 illustrates an example ATP request workflow in which a multiple line-item ATP request 30 is created at client 12, client 12 submits ATP request 30 to fulfillment server 16, and fulfillment server 16 brokers ATP request 30 against one or

more LFMs 22 and/or ATP servers 14 in the form of component ATP requests 32. These LFMs 22 and/or ATP servers 14 process component ATP requests 32, generate resulting component quotations 34, and send the component quotations 34 to fulfillment server 16. Fulfillment server 16 processes the component quotations 34 and generates a unified quotation 36, which is sent to client 12 for review.

Initiate ATP Request [Client]

In one embodiment, to initiate ATP request 30, client 12 or an associated user may be required to provide appropriate identification and security information. Client 12 may support default business rules or other constraints according to a user profile, a customer profile, or other suitable definitions. When the user accesses an ATP request screen associated with client 12, the screen may be populated with default parameters according to such definitions. The user may then optionally adjust some or all of these parameters to suit the needs of the particular ATP request 30. Such parameters may include shipping requirements, preferences with respect to product sourcing, product alternates or substitutions, ship-to location, price targets, and any other appropriate parameters. The parameters may also include attributes of the requested item. For example, a request 30 may specify the desired model, color, and engine of an automobile. In a particular embodiment, client 12 may specify that some or all of the attributes are mandatory. Client 12 could also submit values identifying the importance or desirability of each of the attributes of the requested product.

In one embodiment, the user may select a product from a table of available products, organized according to product group or in another suitable manner, using a product catalog, search engine, or otherwise. A catalog could, for example, include products from all suppliers in system 10. The catalog could also include a search engine allowing a user to locate desired products. In a particular embodiment, the search engine may support attribute-based searches that match attributes of products with attributes supplied by a user. A catalog could reside within fulfillment server 16, or fulfillment server 16 may communicate with an external catalog or order management system to support catalog functions in system 10. In a particular embodiment, fulfillment server 16 maintains a model of the items and suppliers in the marketplace, and changes to an external catalog may be replicated in fulfillment